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PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Castors

I, JOHN ALFRED PALMER, a British subject, of "Hillside", Huncote Road, Croft, Leicestershire, do hereby declare the invention for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to castors as used on trolleys, beds, furniture and in manifold such-like cases. Moreover, it is particularly concerned with castors of the swivel type and in which the axle of the wheel or roller is carried by a fork having an upstanding stem which has a rotatable fit in a sleeve intended for fixing to the structure to be supported.

In these arrangements an annular bearing race is normally provided in a coned arrangement between the upper end of the fork and the lower part of the sleeve. In effect, the lower end of the sleeve is provided with a skirt to encap a peripheral shoulder presented by a spigot on the fork, and a set of ball bearings is disposed in grooves machined in the angle of the shoulder and the confronting inclined inner wall of the skirt, if these are of hard metal, or in annular linings representing such grooves if the fork, for instance, is a soft metal casing.

As will be appreciated this involves problems in machining the ball races and requires delicacy in supporting the bearings during the assembly of the components. Further, where the fork is cast in soft metal the fitting of the hard metal lining race requires time and trouble.

With the object of avoiding such problems, by the present invention we provide a swivel castor in two separable parts made as castings from soft metal, viz. a wheel-carrying fork with a yoke bridging the arms of the fork and having a plane upper surface portion with a stem upstanding therefrom, and a sleeve receiving this stem with a rotatable fit and having a lower enlarged portion with an inset underface matching said upper surface portion

of the yoke, a circular groove of substantially semi-circular section being machined in each of said underface and said surface portion, and these grooves being complementary to form a race for a ring of closely-spaced hard spherical bearings.

The advantages of this arrangement will now be seen. In the first place the grooves can be more easily machined in flat surfaces, allowing for great precision. Secondly, the pressure on the ball bearings in use is in the axial direction, so avoiding unbalanced wear and the need for hard metal linings. Thirdly the assembly of the bearings is simple since they have only to be placed in the groove from which they cannot escape inwards, outwards, or downwards.

A form of castor in accordance with the present invention is illustrated in the accompanying drawings in which:

Figure 1 is a side view partly in section and

Figure 2 is an end view.

Basically the castor illustrated comprises a fork 1 which is made as an iron casting and with its legs 2 straddling the castor wheel 3, the axle 4 of this wheel passing through the ends of the arms 2 and being carried by the latter with interposed bearing discs 5. At its upper end the fork has a yoke 6 formed with a rebate defining a central boss 7 with a flat upper surface 8. The yoke 6 also carries a central upstanding cylindrical steel stem 9.

The upper component of this castor, which is also made of cast iron, comprises a cylindrical sleeve 10 which receives the stem 9 with a close rotational fit at its upper part, this sleeve being provided at the lower end with an enlarged skirt-forming part 11 having a depending rim 12 which encaps the fork boss 8. This rim further defines an inset flat underface 13 at the lower end of the sleeve.

The two components, i.e. the fork 1 and the sleeve 10, are assembled together by passing a cotter pin 14 diametrically through the

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upper end of the stem protruding beyond sleeve 10, a washer 15 being disposed around stem 9 below this pin.

In accordance with the present invention, the opposed faces 8 and 13 of the fork and sleeve skirt respectively are machined with complementary circular grooves of substantially semi-circular cross-section, these grooves being concentric with the stem 9. In production of the castor these grooves are precision machined and complement one another in such a way as to form an annular groove of circular cross-section. In the drawing the gap between the face 8 and 13 has been exaggerated to facilitate illustration, and it will be appreciated that the spacing will be considerably narrower than that shown, this being permissible with precision machining.

As has already been expounded, the complementary grooves in question form a race 16 which can directly receive a set of separate hard steel balls 17 to form the rotary bearing between the two components of the castor. In practice use is made of accurately-sized high grade steel balls and the tolerances used in the machining are such that the grooves are identically sized to close limits and that the balls will have all round contact with the walls of these grooves and will also be in contact one with the next.

This precision machining can be carried out easily in the particular metal here used, and it will also be appreciated that assembly of the castor can be rapid and trouble-free. It is, in fact, only necessary to drop the appropri-

ate number of balls 16 into the groove in the fork 1 and then to slide the sleeve 10 down the stem 9 and insert the cotter pin 14. There is no delicate mounting of the balls to be catered for and, in practice, it is found that a very precise and long-lasting rotary bearing is produced.

As indicated above, the castor can find a use in many fields. As an example it has been indicated in Figure 1 that the sleeve may be introduced into the lower end of a tubular leg 18 on a hospital bed and quickly secured by means such as the grub screws 19 illustrated.

WHAT I CLAIM IS:—

1. A swivel castor in two separable parts made as castings from soft metal, viz. a wheel-carrying fork with a yoke bridging the arms of the fork and having a plane upper surface portion with a stem upstanding therefrom, and a sleeve receiving this stem with a rotatable fit and having a lower enlarged portion with an inset underface matching said upper surface portion of the yoke, a circular groove of substantially semi-circular section being machined in each of said underface and said surface portion, and these grooves being complementary to form a race for a ring of closely-spaced hard spherical bearings.

2. A swivel castor substantially as herein described with reference to the accompanying drawings.

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COMPLETE SPECIFICATION

1 SHEET

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the Original on a reduced scale*

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